

& Inger (1957) observation that *M. q. margaritifer* lays 10 eggs under stones or logs and that the species may lay communally. The reference does not cite a country for the Schmidt & Inger observations but as these workers were active in Zaire for some time; it is safe to assume that Fitch had this territory in mind. However, in the light of the current observations from Zululand it would seem that the species is in fact oviparous throughout its range.

Finally, G. Setaro and I. Knezovich inform me that another *Mabuya* at Durban, as yet without precise identity, is oviparous. On geographical and other considerations this species will probably prove to be either *M. varia* (Peters) or *M. striata* (Peters).

REFERENCES

- DUFAURE, J. P. & HUBERT, J. 1961. Table de développement du lézard vivipare: *Lacerta (Zootoca) vivipara* Jacquin. *Archs Anat. Microsc. Morph. exp.* 50:309–328.
- FITCH, HENRY S. 1970. Reproductive cycles in lizards and snakes. *Univ. Kans. Publs Mus. nat. Hist.* 52:1–247.
- FITZSIMONS, V. M. 1943. The lizards of South Africa. *Transv. Mus. Mem.* 1:xv + 528.
- PIENAAR, U. DE V. 1966. The reptile fauna of the Kruger National Park. *Koedoe*, 1966:1: 1–223.
- SCHMIDT, K. P. & INGER, R. F. 1957. *Living reptiles of the world*. Hamish Hamilton, London.

TYTO ALBA PREY IN SOUTH WEST AFRICA AND THE NORTHERN CAPE

W. R. J. DEAN

*Barberspan Ornithological Research Station,
Western Transvaal*

Ten collections of barn owl (*Tyto alba*) pellets from four localities in South West Africa and four collections from three localities in the northern Cape have been analyzed. Localities of the barn owl roosts and pellet collection sites are listed below.

South West Africa

1. 25 km east of Windhoek. 22°32'S/17°16'E. Roost in a cave in mica schist. 30 April 1972.
2. Valencia Ranch, Friedenthal district. 23°10'S/16°25'E. Roost in a cave in mica schist. 23 May 1973.
3. Gamsberg. 23°15'S/16°24'E. Roost in a deserted house in a river valley. Surrounding habitat mainly steep hillsides with *Acacia erubescens*. 18 April 1973.

4. Gochas. 24°30'S/18°32'E. This is the same locality as Vernon's (1972) locality 13. Seven collections made between 16 July 1972 and 4 August 1973.

Northern Cape

5. Heuningvlei. 26°17'S/23°14'E. Roost in a cave in banded ironstone. 22 March 1973.
6. Kingston, Kimberley district. 28°43'S/24°12'E. Roost in an old well in mixed *Acacia tortilis*, *A. mellifera* and *Tarchonanthus camphoratus* scrub. 11 July 1972 and 7 April 1973.
7. Marrick, Kimberley district. 28°50'S/24°15'E. Roost in an old well in mature *Acacia tortilis* woodland. 10 July 1972.

Notes on the prey species

Suncus varilla. This small shrew has not been recorded in the Kimberley area although Meester & Lambrechts (1971) give 'north eastern Cape' in their distribution notes on *Suncus varilla orangiae* (Roberts).

The UTR (the only measurement that could be taken due to cranial damage on the pellet specimens) of the Kimberley material averages

TABLE 1
Prey of *Tyto alba*

Species	Collection site						
	1	2	3	4	5	6	7
Mammals							
<i>Suncus varilla</i>						25	2
<i>Crocidura hirta</i>			7			17	
<i>Crocidura (cyanea group)</i>		16	3	1	20	18	1
<i>Crocidura bicolor</i>	2		1	1		15	1
<i>Elephantulus rupestris</i>		3		3			
<i>Elephantulus intufi</i>					9		
<i>Tadarida bocagei</i>				2	19		
<i>Eptesicus capensis</i>				1			
<i>Cryptomys</i> sp.						9	
<i>Otomys</i> sp.						2	
<i>Malacothrix typica</i>				27	3	32	5
<i>Steatomys</i> sp.	2	12				1	2
<i>Desmodillus auricularis</i>	9	2		112	6	12	1
<i>Tatera</i> sp.	4	44	4	154	21	79	7
<i>Gerbillus paeba</i>		2		742	21	25	1
<i>Saccostomus campestris</i>			1		3	15	
<i>Mus minutoides</i>	3	16	2	41	1	241	6
<i>Praomys natalensis</i>	6					25	2
<i>Rhabdomys pumilio</i>		2		18	5	7	
<i>Aethomys namaquensis</i>	2	95	32	4	13	5	
<i>Thallomys paeulcus</i>	1	6	3	1			
Birds							
<i>Mirafra sabota</i>		2					
<i>Mirafra</i> sp.						1	
<i>Sporopipes squamifrons</i>	1			3		1	
<i>Ploceus velatus</i>				3			
Unidentified birds				11	2	4	1
Lizards		3		8	2	4	
Frogs				1	1		
Arthropods	*	*		*	*	*	*
Total vertebrate prey animals	30	203	53	1133	126	538	29

* Present in pellets but not quantified.

6,9 mm (range 6,5–7,2 mm; S.D. 0,117; $n = 19$). This is larger than the mean of 6,6 mm (range 6,0–7,1 mm) given by Meester & Lambrechts (1971) for *S. v. varilla*. The difference in means is statistically significant (Students *t* test, Simpson, Roe & Lewontin, 1960; $t = 2,07$; $p < 0,05$). *S. v. orangiae* is regarded as a smaller race than nominate *S. v. varilla* and the similarly sized race *S. v. warreni* Roberts that occurs in the north western Cape Province. The possibility of a larger race of *S. varilla* in the northern Cape must be considered and the eventual examination of a series of specimens from the area may prove interesting.

Tadarida bocagei. Bats are seldom taken by barn owls. Vernon (1972) recorded Bocages free-tailed bat in diets of barn owls at two localities, both cliff roost sites. It is interesting that so many free-tailed bats were taken at the Heuningvlei roost site and this is probably the owls' exploitation of locally abundant species.

ACKNOWLEDGEMENTS

I am grateful to the Peabody Museum of Natural History, Yale University, for the opportunity to collect this material. I thank T. N. Pocock and Professor J. Meester for comments on a draft of this note.

REFERENCES

- MEESTER, J. & LAMBRECHTS, A. VON W. 1971. The southern African species of *Suncus* Ehrenberg (Mammalia: Soricidae). *Ann. Transvaal Mus.* 27:1–14.
- SIMPSON, G. G., ROE, A. & LEWONTIN, R. C. 1960. *Quantitative Zoology*. Harcourt, Brace & World: New York.
- VERNON, C. J. 1972. An analysis of owl pellets collected in southern Africa. *Ostrich* 43: 109–124.

POSSIBLE STIMULI FOR SOCIAL BEHAVIOUR IN THREE SPECIES OF FRESHWATER FISH

J. HATTINGH & N. COETZEE
Department of Zoology, Rand Afrikaans University, Johannesburg

Social behaviour in fish is manifested in many situations and one form of this phenomenon is especially interesting. Some species of fish have the tendency to form schools or to clump together. According to authorities on fish behaviour these fish either maintain a remarkably constant geometric orientation to their fellows or merely live in close proximity to their kind (Shaw 1962). The first situation is referred to as schooling, and the second has no specific nomenclature but could be termed clumping. The essential difference is that schooling fishes swim together, feed,

approach, turn and flee together and do not have leaders (Shaw 1962). Clumping fish on the other hand, mostly come together only when startled, otherwise feeding and swimming on their own.

The potential adaptive advantages of schooling or clumping are many (Shaw 1962). The stimuli necessary for this behaviour, however, remain obscure. Keenleyside (1955) showed that vision is crucial in maintaining schools of fish and that blinding may eliminate this response (*Pristella*). Shaw (1962) found that fish of similar size school, that a head-to-tail approach is important and that movement outweighs colour and species as far as visual stimuli are concerned (*Menidia*). Apparently the lateral line organs are important in this respect. Hearing, taste and smell are not regarded as effective stimuli by Shaw, but according to Goz (1941) the nasal sacs are important in schooling in non-predatory fish (*Phoxinus* and *Gobia*).

In an effort to obtain further information on this behaviour in fish, three species of freshwater teleosts were investigated with regard to body shape and odour and preliminary results